

## CLAIMS :

1. A capillary array electrophoresis apparatus comprising: a thermostatic oven which includes a space  
5 and can accommodate a plurality capillary arrays of different length exchangeably; means for controlling the temperature of the thermostatic oven; a selected capillary array which is disposed in the space; means for supplying an object sample into capillaries in the  
10 capillary array from one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the other end of the capillary array; means for irradiating light beam to the object sample in the capillary array at the out side space of the  
15 thermostatic oven and for irradiating the same at the same time to the adjacent capillaries through a lens action of the capillaries; and means for detecting fluorescence caused by the irradiation.
- 20 2. A capillary array electrophoresis apparatus comprising: a capillary array disposed in a thermostatic oven which includes a space permitting temperature adjustment; means for supplying an object sample into capillaries in the capillary array from  
25 one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the other end of the capillary array; means for

005203.05101

irradiating light beam to the object sample in the capillary array at the out side space of the thermostatic oven and for irradiating the same to all of the capillaries through a lens action of the  
5 capillaries; means for detecting the fluorescence; and a holding portion of a plurality of capillary arrays at a wall constituting the space so that the plurality of capillary arrays having different length can be exchangeably held in the space.

10

3. A capillary array electrophoresis apparatus comprising: a thermostatic oven which permits temperature adjustment and includes a space which can accommodate a plurality capillary arrays of different  
15 length selectively; means for supplying an object sample into capillaries in the capillary array from one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the other end of the capillary array; means for  
20 irradiating light beam all of the capillaries in the capillary array in the out side space of the thermostatic oven and for causing emission of fluorescence from the sample in the capillaries; and means for detecting the fluorescence; and a plurality  
25 of fans each having different air suction and air discharge directions are disposed substantially most separate positions in the space of the thermostatic

CP552029, US10101

oven to agitate the air therein.

4. A capillary array electrophoresis apparatus comprising: a capillary array disposed in a
- 5 thermostatic oven which includes a space permitting temperature adjustment; means for supplying an object sample into capillaries in the capillary array from one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the
- 10 other end of the capillary array; means for irradiating light beam to the object sample within the capillaries in the capillary array at the out side space of the thermostatic oven and for successively irradiating the adjacent capillaries through a lens
- 15 action of the capillaries; means for detecting the fluorescence; a first syringe having a predetermined volume; a second syringe having a smaller volume than that of the first syringe; and a pump device which injects under pressure an electrophoresis medium to
- 20 the first syringe and further injects under pressure the electrophoresis medium of a predetermined amount from the first syringe to the second syringe through a check valve.
- 25 5. A capillary array electrophoresis apparatus comprising: a capillary array disposed in a space permitting temperature adjustment; means for supplying

00000000.001001

an object sample into capillaries in the capillary array from one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the other end of the capillary array; 5 means for irradiating laser beam to the capillaries in the capillary array at the out side of the space and for causing emission of fluorescence from the sample existing within the capillaries; and means for detecting the fluorescence, wherein the sample is 10 supplied to the one end of the capillary array from the bottom portion in the space, the other end of the capillary array containing the sample subjected to electrophoresis is projected from the side portion of the space and the laser beam is irradiated onto the 15 projected capillary array, thereby fluorescence is outputted.

6. A capillary array electrophoresis apparatus comprising: a capillary array disposed in a 20 thermostatic oven which includes a space permitting temperature adjustment; means for supplying an object sample into capillaries in the capillary array from one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the 25 other end of the capillary array; means for irradiating laser beam to the capillaries in the capillary array at the out side of the space and for

causing emission of fluorescence therefrom; and means for detecting the fluorescence, wherein an array plane face constituting a detection portion of the capillary array is arranged to be substantially in parallel with  
5 the laser beam.

7. A capillary array electrophoresis apparatus comprising: a capillary array disposed in a space permitting temperature adjustment; means for supplying  
10 an object sample into capillaries in the capillary array from one end of the capillary array; means for supplying an electrophoresis medium into the capillaries from the other end of the capillary array; means for irradiating laser beam to the capillaries in  
15 the capillary array and for causing emission of fluorescence therefrom; and means for detecting the fluorescence, wherein major elements in the fluorescent detection means are substantially arranged on one plane face and the respective capillaries at  
20 the irradiation and detection portion in the capillary array are aligned so as to cross the one plane face.

8. A method of separating and analyzing sample in which a selected capillary array is disposed in a  
25 space of a thermostatic oven which permits temperature adjustment and includes the space which can accommodate a plurality capillary arrays of different

length exchangeably, wherein an object sample is supplied into capillaries in the capillary array from one end of the capillary array; an electrophoresis medium is supplied into the capillaries from the other  
5 end of the capillary array; laser beam is irradiated to the object sample existing within the capillaries in the capillary array at a position of capillary array projecting from the space; and fluorescence emitted by the laser beam irradiation is detected.

10

9. A capillary array electrophoresis apparatus comprising: a thermostatic oven which includes a space and can accommodate a plurality capillary arrays of different length exchangeably; a heating and cooling  
15 device to control the temperature of the thermostatic oven; a selected capillary array which is disposed in the space; a sampler to supply an object sample into capillaries in the capillary array from one end of the capillary array; a polymer solution pump to supply an  
20 electrophoresis medium into the capillaries from the other end of the capillary array; an optical system connected to a light source to irradiate light beam to the object sample in the capillary array at the out side space of the thermostatic oven and to irradiate  
25 the same at the same time to the adjacent capillaries through a lens action of the capillaries; and a light detector to detect fluorescence caused by the

irradiation.

10. The capillary array electrophoresis apparatus according to claim 9, wherein a holding portion of a plurality of capillary arrays at a wall constituting the space so that the plurality of capillary arrays having different length can be exchangeably held in the space.

10 11. The capillary array electrophoresis apparatus according to claim 9, wherein a plurality of fans each having different air suction and air discharge directions are disposed substantially most separate positions in the space of the thermostatic oven to  
15 agitate the air therein.

12. The capillary array electrophoresis apparatus according to claim 9, which further comprises a first syringe having a predetermined volume; a second  
20 syringe having a smaller volume than that of the first syringe; and a pump device which injects under pressure an electrophoresis medium to the first syringe and further injects under pressure the electrophoresis medium of a predetermined amount from  
25 the first syringe to the second syringe through a check valve.

00000000.001001

13. The capillary array electrophoresis apparatus according to claim 9, wherein the sample is supplied to the one end of the capillary array from the bottom portion in the space, the other end of the capillary array containing the sample subjected to electrophoresis is projected from the side portion of the space and the laser beam is irradiated onto the projected capillary array, thereby fluorescence is outputted.

10

14. The capillary array electrophoresis apparatus according to claim 9, wherein an array plane face constituting a detection portion of the capillary array is arranged to be substantially in parallel with the laser beam.

15

15. The capillary array electrophoresis apparatus according to claim 9, wherein major elements in the fluorescent detector are substantially arranged on one plane face and the respective capillaries at the irradiation and detection portion in the capillary array are aligned so as to cross the one plane face.

20

09052029.057004